Amendments to the Drawings:

The Examiner has objected to the drawings, as filed, due to the omission of labels from the blocks in FIGs. 1-4, and, as such, required correction.

In response, the Applicant has now enclosed herewith red-lined drawing sheets for these figures which show the proposed addition of labels, marked in red, for the various blocks in these figures.

Attachment: Replacement Sheet
Annotated Sheet Showing Changes

REMARKS

In view of both the amendments presented above and the following discussion, the Applicant submits that none of the claims now pending in the application is either anticipated under the provisions of 35 USC § 102. Thus, the Applicant believes that all of these claims are now in allowable form.

If, however, the Examiner believes that there are any unresolved issues requiring adverse final action in any of the claims now pending in the application, the Examiner should telephone Mr. Peter L. Michaelson, Esq. at (732) 542-7800 so that appropriate arrangements can be made for resolving such issues as expeditiously as possible.

Specification amendments

Various amendments have been made to the specification to correct minor inadvertent formal and grammatical errors.

Abstract amendments

The Examiner required the Applicant to modify the abstract, as filed, apparently and primarily owing to its inclusion of various phrases that might have implicit, rather than specific express, meanings.

In response, the Applicant has enclosed a suitably revised substitute abstract.

Drawings

The Examiner has objected to the drawings, as filed, due to the omission of labels from the blocks in FIGs. 1-4, and, as such, required correction.

In response, the Applicant has now enclosed herewith red-lined drawing sheets for these figures which show the proposed addition of labels, marked in red, for the various blocks in these figures. The Applicant now respectfully requests the Examiner's approval of these corrections.

To expedite prosecution, the Applicant has also enclosed a set of replacement formal drawing sheets, for all the figures in the application (Figs. 1-6), and which incorporate these corrections.

Status of claims

To simplify amending the claims and hence expedite their examination, the Applicant, rather than re-writing the prior claims, has simply canceled all his prior claims 1-22 and substituted new claims 23-41 there for.

New independent method claim 23 and apparatus claim 38 recites the invention with increased precision than did prior corresponding claims 1 and 19.

New claims 23 and 38, among other aspects, contain substantive limitations of prior claims 1 and 5, and 5 and 19, respectively.

Rejections under 35 USC §102

The Examiner has rejected claims 1-22 under the provisions of 35 USC § 102(b) as being anticipated by any one of three applied references: (a) German patent application DE 19639414 (inventor: L. Rademacher), (b) United States patent 5,929,804 (issued to T. H. P. Jones et al on July 27, 1999), and (c) United States published patent application 2003/0022649 (inventor: N. Voyer). Inasmuch as all these claims have now been cancelled, these rejections are moot. Nevertheless, since these claims have been replaced by new claims 23-41, then, to facilitate prosecution, these rejections will be collectively discussed in the context of these new claims and principally with respect to independent method claim 23. With respect to these new claims, all these rejections are respectfully traversed.

In essence, the Examiner takes the position that each of the features recited in each of prior claims 1-22 was identically disclosed by each one of the three applied references, taken by itself. In that regard, the Examiner specifically refers to: in the Rademacher application -- Figs. 4-7, col. 1, line 52 through col. 3, line 19, and col. 5, line 59 through col. 6, line 37; col. 5, lines 21-41 of the Jones patent; and paragraph 11 in the Voyer application. As the Examiner will soon appreciate, this view is incorrect with respect to the Applicant's new claims, particularly claim 23.

To elucidate the present invention, and its distinguishing features, as now claimed, the ensuing

discussion will first address general considerations regarding the systems, specifically mobile telephone and satellite communication systems, addressed by the three references and then specifically discuss each of these references and how the claimed invention principally distinguishes over the teachings of that reference.

A. General considerations -- mobile telephone communications systems vis-à-vis satellite receivers

Generally speaking, the Rademacher and Voyer applications relate to mobile communication, specifically mobile cellular telephone, systems, whereas the Jones patent relates to a satellite receiver. Receivers in mobile phone systems operate in a completely different manner than do satellite receivers

Given that, a skilled person will not look in the field of receivers for mobile phone systems for relevant teachings were he to be faced with a problem of how to improve a satellite receiver -- as the present Applicant faced and solved.

First, a significant difference exists in the received signals themselves between those occurring in mobile phone systems as against those in satellite receivers. Specifically, mobile phone communication systems typically receive "interference-limited" signals. That is, the signals, as received, are strong and have a relatively high signal-to-noise ratio, typically about 10 dB, with their reception mainly being limited by interference between

different signal sources. In this respect, see for example col. 1, lines 33-51 in the Rademacher application.

In contrast, satellite receivers receive so-called "noise-limited" signals. That is, the signals, as received, are weak, and the signal-to-noise ratio is very small, typically between 3.3 and 7 dB, depending on its code rate. Consequently, even in a satellite receiver, where there are no other sources of incoming signals, the reception of a satellite signal still requires a significant amount of noise reduction. Such reduction is not necessary in a mobile telephone environment. Consequently, a low-noise requirement, among other requirements, imposed on a satellite system markedly differs from the constraints imposed on a mobile communication system.

Furthermore, for satellite receivers, the signal transmitted from the satellite travels along a direct path to a receiver. Since the signal itself is very weak, it is very important that the antenna used for the satellite receiver is directly aimed at the satellite as well as possible -- thus affording a straight path of propagation from the satellite to the antenna, and also that the antenna has a relatively narrow beam with a good focus on the satellite.

Alternatively, in a mobile phone system, the transmitted signal from a source, such as from a mobile phone, is often reflected by various objects, such as buildings. In that regard, see, e.g., paragraph 12, lines 4-7 in the Voyer application and col. 5, lines 16-26 in the Rademacher application. As such, components of the

signal transmitted from a mobile phone can travel via a multitude of different paths, having different directions, delays and attenuation, before being received by a mobile communications receiver in a base station. Consequently, the base station receiver has to be able to receive such differing signals and to do so employs so-called "multi-path" or rake receivers. See col. 1, lines 37-41 of the Rademacher application, and paragraph 9, second to last sentence of the Voyer application.

Since multi-path reception and interference-limited signals, which characterize mobile phone communication systems, do not occur with satellite communication, while noise-limited signals and the need for focused reception, which characterize satellite communication systems, do not occur with mobile phone communication systems, the Examiner can readily appreciate that, owing to these unique characteristics, implementing a satellite receiver completely differs from that of a receiver in mobile phone system.

In light of these striking and fundamental technical differences between a mobile phone communication system and a satellite system, a skilled person in the art who seeks to improve a satellite system -- as the present Applicant does -- is very likely not to turn to and consider specific teachings specifically pertinent to a mobile phone communication systems as those teachings are likely to be viewed as non-analogous and thus irrelevant.

B. Rademacher application

The Rademacher application discloses a mobile communication system in which components of a signal are received from different directions and with different delays (see, e.g., col. 1; line 33 et seq, and col. 5 lines 17-33 of that application). The system contains a base station with a receiver. At the receiver, signals es are received by an antenna and outputted to base-band (BB) converters. The base-band converters convert the signals into base band. Data is determined from the received signals es. The base-band signals are manipulated by antenna coefficients a0 ... an and then combined into received data z. Thus, what is referred as "antenna coefficients a0...an" are weighting coefficients used on the base-band data and not a property of the antenna itself.

Received data z is fed into a Viterbi decoder VF. In decoder VF, reference values for the antenna coefficients a and channel coefficients RW are calculated. See col. 5, lines 59 through col. 6, line 11. The reference values are used in a transmission channel model ("Funkkanalmodell") MF. The model output y of the transmission model MF is compared with the received data z. A signal e representing a difference between the received data z and model output y is fed back to the transmission channel model MF.

As specifically taught by the Rademacher application, only the difference e, between the received data z and the model output y, is determined and used as feedback to improve and optimise the transmission channel

model MF. Received data z is used as reference value for the model.

The Rademacher application *fails* to teach that the disclosed system determines whether or not the ones and zeros of the received data **z** derived from the signals **es** are indeed the ones and zeros intended to be transmitted by the source (i.e., a mobile telephone). As such, that application does *not* disclose that the received data z is checked for errors. Further, that application also does *not* disclose that a property of the antenna is adjusted -- which, in contrast, the present application teaches.

In that regard, the received data z may contain errors, i.e., that the received data differs from the data transmitted by the source, due to illustratively distortion of the signals es, or be error-free, i.e., exactly the same as the transmitted data. However, in the system taught by the Rademacher application, the received data is *not* checked for errors and hence whether the received data contains errors or not is therefore unknown. Consequently, the Rademacher application *fails* to teach the concept that any such errors in the received data can be used to change a property of the satellite system -- a concept with the present application also teaches.

C. Jones patent

The Jones patent does *not* disclose that data is determined from received signals. Therefore, that patent does *not* disclose that the data is checked for errors, since this requires knowledge as to what specific data is then

represented by the signals. Since this patent simply does not disclose that the data is checked for errors, then concomitantly and clearly that patent does *not* disclose that the errors in the data are used to adjust a property of a satellite system.

In this respect, a fundamental distinction exists between signals and data represented by the signals. The data (or the information) represented by the signals is, e.g., binary ones and zeros or ASCII characters or other types of data. In contrast, the signals themselves are electrical or electromagnetic waves with a certain amplitude and phase. These waves can have a certain meaning, e.g., a certain shape of the waves may represent amplitude or phase, and/or other aspects of the waves may be interpreted as representing corresponding informational content or data. Determining the data from the signals requires that the signals be compared with some data determining criterion, such as, e.g., for binary data whether or not a signal has a positive or negative amplitude or an amplitude above a certain threshold and thus corresponds with either a binary datum zero or one.

In cases where *data* is checked for errors, this means that a comparison is made between the data itself, e.g., the binary ones and zeros, that have been received and the data that was intended to have been transmitted from a data source. Alternatively, where *signals* are checked for errors, for example, the phase of the signals or another property of an electrical or electromagnetic wave is checked. When checking a signal for errors, one does not need to know what data the signals represents as the data

content is irrelevant. In fact, checking a signal for errors is an operation completely different from checking data for errors.

If the Examiner takes the view -- which is rather unclear from the explanation which the Examiner provided underlying the rejection over the Jones patent -- that the Jones patent generally teaches that data is checked for errors, then that view is incorrect. The Jones patent does *not* teach the concept that received data is checked for an amount of data errors. In fact, that patent does *not* even disclose a *receiver*, but rather a *transmitter*. This is quite evident from Figs. 1-2 of that patent inasmuch as outputs of amplifiers Amp1-Amp4 are transmitted to antennas S_1-S_4 via the Butler matrix (FCN) and the phase shifters. Thus, that patent does *not* even disclose that satellite signals are received but only that such signals are transmitted.

Further, the Jones patent discloses that, during reconfiguration of a beam-forming system, the settings of both phase shifters and amplifiers are optimised. See, e.g., col. 5, line 21 et seq of that patent. To accomplish this optimisation, a substitute circuit is positioned at the input of the beam-forming system. A signal with the target values ($A_i^v;\phi_i^v$) is provided to the input of the substitute circuit. Resulting values ($A_i^';\phi_i^'$) of the signals provided, as output, by the system, through use of the substitute circuit, are compared with those of the input signal with the difference between both then being minimized. See, e.g., col. 3, lines 46-54 and col. 9, line 51 et seq. Thus,

through such optimisation, the data represented by the signals is *not* determined, and hence neither is any error in the data.

D. Voyer application

The Voyer application discloses a method and device for receiving signals, transmitted from mobile telephones, in a base station. The device includes a plurality of antennas 300_0-300_{n-1} connected to a number of beam formers 310_0-310_{L-1}. The beam formers are connected to a combination module 315 which combines signals $\phi_0 \ldots \phi_{L-1}$ from the beam formers with combination coefficients $\gamma_{0\ldots}$ γ_{L-1} into an output signal y. See page 3, paragraph 46 of the Voyer application. The combination coefficients $\gamma_{0\ldots}$ γ_{L-1} are determined by optimisation module 316.

However, the Voyer application does *not* describe that, in the beam formers, the combination module or the optimisation module, the data represented by the received signals is determined. In particular, the optimisation module determines a correlation between the signals $\phi_0 \ldots \phi_{L-1}$ from the beam formers and a replica of a reference signal d transmitted by a source of the signal -- as indicated by equation 7. Resulting conjugated correlation coefficients $\alpha_0 \ldots \alpha_{L-1}$ are then used as the combination coefficients $\gamma_{0\ldots}$ γ_{L-1}.

As in the case for the system taught in the Rademacher application, the output signal y could contain data errors (with reference to the data provided by the

source and intended to be transmitted) or not, i.e., the data content in the received signal exactly reflects what was intended to be transmitted. However, in the Voyer application, the only known aspect which involves comparing the received signals against another signal is the correlation between the signals $\phi_0 \ldots \phi_{L-1}$ from the beam formers and the replica of the reference signal d. The combined signal y is not checked for data errors and thus any such data errors in the output signal are unknown.

Accordingly, in the Voyer application, while the correlation between signal components and a reference signal is used to determine combination coefficients $\gamma_0 \ldots \gamma_{L-1}$, the data determined from a received signal is *not* checked for errors.

As explained above, each of the Rademacher and Voyer applications, and the Jones patent *fails* to disclose a method in which data errors are determined from the data represented by received signal. This distinguishing aspect is specifically recited in the Applicant's claim 23. Further, in light of the teachings that are omitted from each of these three references -- also as discussed above, this distinguishing aspect would *not* result from or even be implicit in or suggested by any combination of the teachings that do exist in any of these references, regardless of whether those references are considered singly or in any combination.

As previously discussed above at the onset of the discussion of the present rejections, the satellite

communication and mobile telephone communication systems, as disclosed in three applied references, are technically incompatible with each other. Thus, a skilled person in the art would therefore *not* be inclined to combine the teachings of either the Rademacher and/or Voyer applications with those in the Jones patent or with those of any other satellite system. Even if, by way of a theoretical exercise, such a person were to hypothetically make such a combination, the result, also as discussed above, would not be a method having the features recited in claim 23.

Independent claim 23 contains suitable limitations that clearly and explicitly recite these and other distinguishing features of the present invention. This claim recites as follows, with its principal distinguishing recitations shown in a bolded typeface:

> "A method for optimising at least one property of a satellite system, the satellite system having a satellite provided with a transmitter for transmitting a satellite signal representing data, and a satellite receiver comprising an antenna array with at least two antenna elements for receiving said satellite signal, wherein the method comprises the steps of:
>
> receiving, at said satellite receiver, the satellite signal so as to define a received satellite signal;
>
> **determining, from the received satellite signal, received data;**
>
> **checking said received data for an amount of data errors; and**
>
> **if a result of said checking satisfies a predetermined criterion, changing gain, phase or electrical delay of at least one of said at least two antenna elements.**" [emphasis added]

Thus, in the absence of these, among other, claimed features being disclosed, let alone identically, in

the teachings of any of the applied references, the Applicant submits that claim 23 is *not* anticipated by those teachings. Accordingly, claim 23 is patentable under the provisions of 35 USC § 102(b).

Each of new claims 24-37 depends, either directly or indirectly, from new independent claim 23 and recites further distinguishing aspects of the present invention over those recited in that independent claim. Furthermore, new media claim 41 references and incorporates the limitations of independent method claim 23. Hence, the Applicant submits that each of dependent claims 24-37 and media claim 41 is also not anticipated by the teachings of any of the three applied references for the exact same reasons set forth above with respect to claim 23. Consequently, each of these new claims is also patentable under the provisions of 35 USC § 102(b).

New independent apparatus claim 38, being directed to an optimisation device, contains distinguishing limitations very similar to those expressly recited in claim 23. Hence, new claim 38 is similarly not anticipated by the teachings in any of the three applied patents for the same reasons set forth above with respect to claim 23.

New apparatus claim 39 references and incorporates the limitations of independent claim 38 and also recites additional features over those in claim 38. New claim 40 directly depends from new independent claim 39 and recites further distinguishing aspects of the latter claim. Accordingly, the Applicant submits that neither of new claims 39 and 40 is anticipated by the teachings in any of

the three applied patents for the same reason set forth above with respect to claim 38 and hence claim 23.

Consequently, each of claims 38-40 is also patentable under the provisions of 35 USC § 102(b).

Thus, all these rejections should now be withdrawn.

Conclusion

Consequently, the Applicant believes that all the claims, as they now stand, are presently in condition for allowance. Accordingly, both reconsideration of this application and its swift passage to issue are earnestly solicited.

Respectfully submitted,

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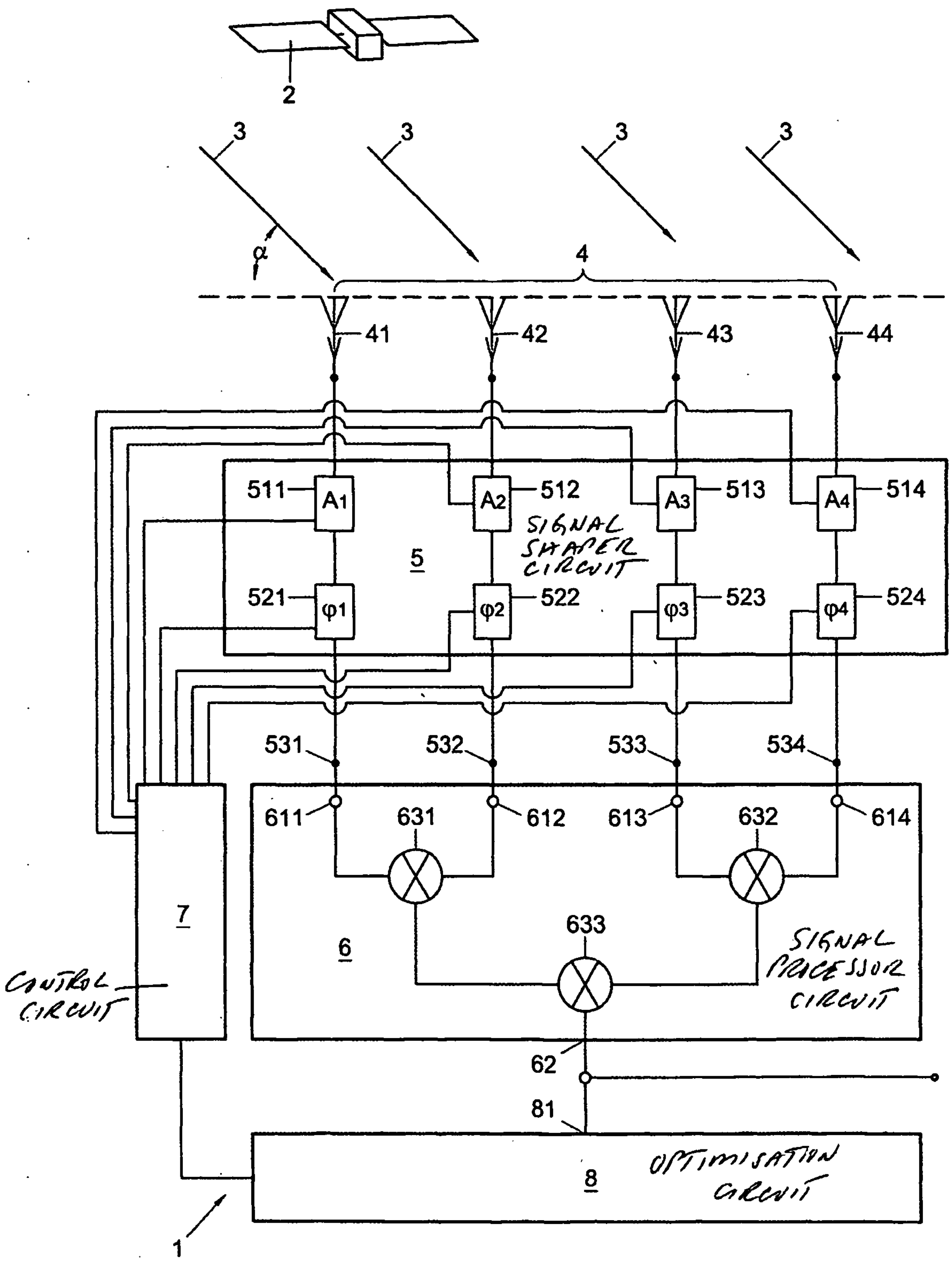
2
3
3
3
3
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41
42
43
44
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A1
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A3
514
A4
SIGNAL SHAPER CIRCUIT
5
521
φ1
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φ2
523
φ3
524
φ4
531
532
533
534
611
631
612
613
632
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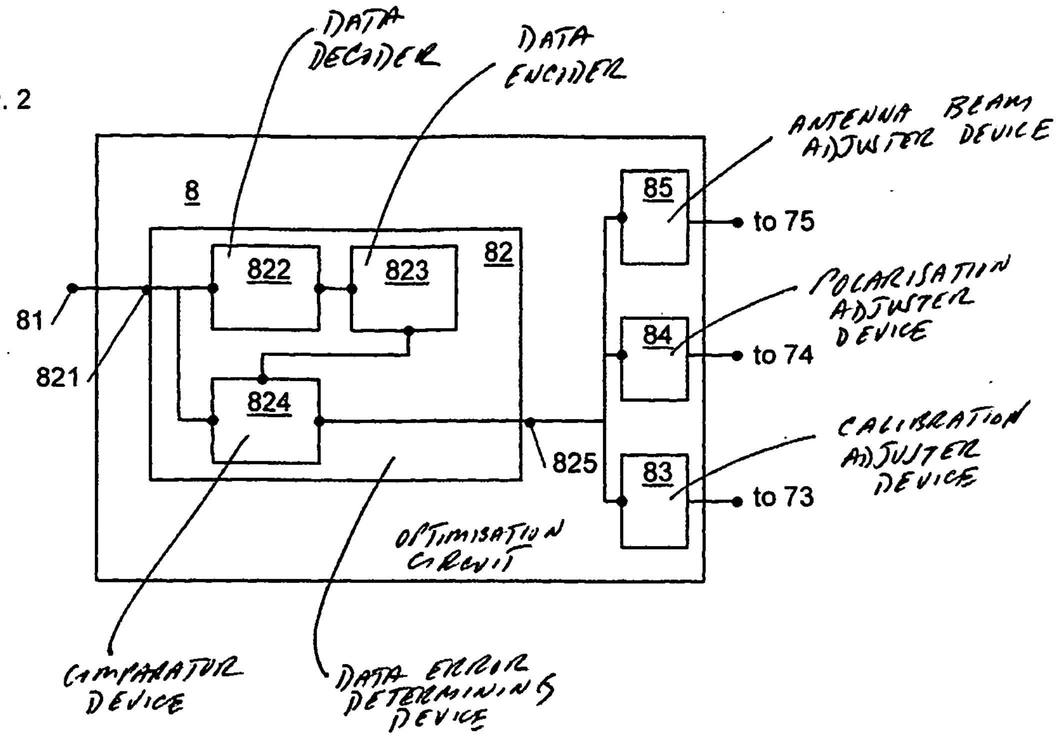
7
633
6
SIGNAL PROCESSOR CIRCUIT
CONTROL CIRCUIT
62
81
8
OPTIMISATION CIRCUIT
1

Fig. 1

Fig. 2


DATA DECODER
DATA ENCODER
ANTENNA BEAM ADJUSTER DEVICE
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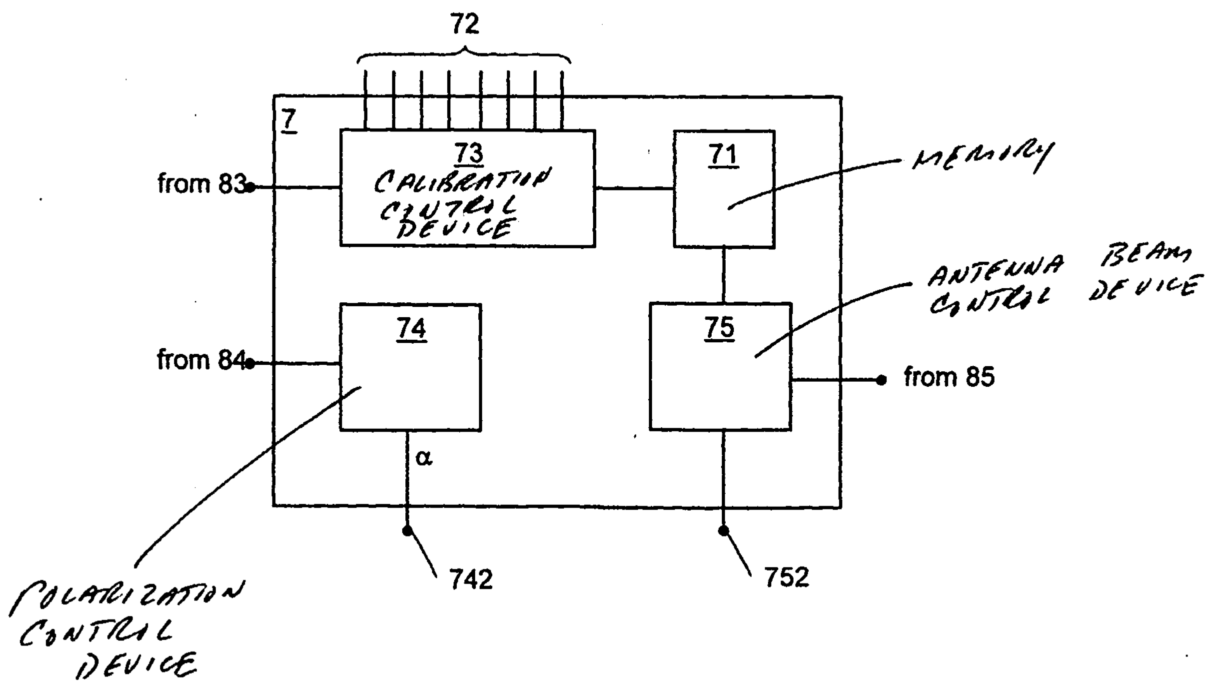
to 75
822
823
82
POLARISATION ADJUSTER DEVICE
81
84
to 74
821
824
CALIBRATION ADJUSTER DEVICE
825
83
to 73
OPTIMISATION CIRCUIT
COMPARATOR DEVICE
DATA ERROR DETERMINING DEVICE

Fig. 3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7
73
CALIBRATION CONTROL DEVICE
71
MEMORY
from 83
ANTENNA BEAM CONTROL DEVICE
74
75
from 84
from 85
α
742
752
POLARIZATION CONTROL DEVICE

Appl. No. 10/561,879
Amdt. dated Dec. 8, 2008
Reply to Office action of June 30, 2008
Annotated Sheet Showing Changes

Fig. 4